

Advanced Algebra

Chapter 1 Test Review

Name KEY

Solve and Graph...don't use a calculator ☹

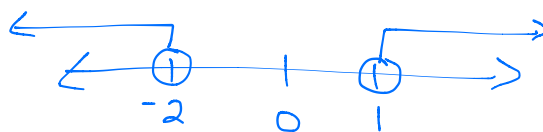
1) $|3x+10|=34$

$$\begin{array}{l} \swarrow \quad \searrow \\ 3x+10 = -34 \quad 3x+10 = 34 \\ \underline{-10} \quad \underline{-10} \quad \underline{-10} \quad \underline{-10} \\ 3x = -44 \quad 3x = 24 \\ \underline{3} \quad \underline{3} \quad \underline{3} \quad \underline{3} \\ x = \frac{-44}{3} \quad x = 8 \end{array}$$



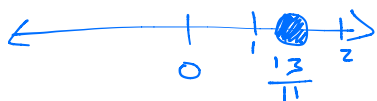
2) $\frac{5-3d}{-5} < 2$ or $\frac{3d+9}{-9} < 3$

$$\begin{array}{l} \frac{5-3d}{-5} < 2 \quad \frac{3d+9}{-9} < 3 \\ \underline{-5} \quad \underline{-5} \quad \underline{-9} \quad \underline{-9} \\ \frac{-3d}{-3} < \frac{-3}{-3} \quad \frac{3d}{3} < \frac{-6}{3} \\ d > 1 \quad d < -2 \end{array}$$



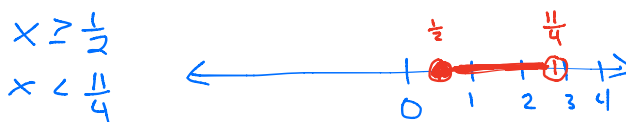
3) $5-4d = 7d-8$

$$\begin{array}{l} 5-4d = 7d-8 \\ +4d \quad +4d \\ 5 = 11d - 8 \\ +8 \quad +8 \\ 13 = 11d \\ \underline{11} \quad \underline{11} \\ \frac{13}{11} = d \end{array}$$



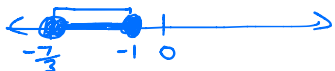
4) $6 \geq 8-4x > -3$

$$\begin{array}{l} 6 \geq 8-4x > -3 \\ \underline{-8} \quad \underline{-8} \quad \underline{-8} \\ -2 \geq -4x > -11 \\ \underline{-4} \quad \underline{-4} \quad \underline{-4} \\ \frac{1}{2} \leq x < \frac{11}{4} \end{array}$$



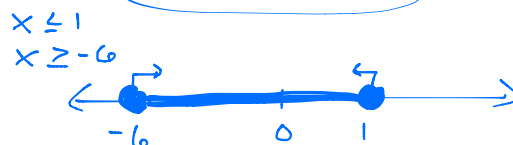
5) $-6|3x+5|+3 \geq -9$

$$\begin{array}{l} -6|3x+5|+3 \geq -9 \\ \underline{-3} \quad \underline{-3} \\ -6|3x+5| \geq -12 \\ \underline{-6} \quad \underline{-6} \\ |3x+5| \leq 2 \\ \swarrow \quad \searrow \\ 3x+5 \geq -2 \quad 3x+5 \leq 2 \\ \underline{-5} \quad \underline{-5} \quad \underline{-5} \quad \underline{-5} \\ 3x \geq -7 \quad 3x \leq -3 \\ \underline{3} \quad \underline{3} \quad \underline{3} \quad \underline{3} \\ x \geq -\frac{7}{3} \quad x \leq -1 \end{array}$$



6) $-12 \leq 3x+6 \leq 9$

$$\begin{array}{l} -12 \leq 3x+6 \leq 9 \\ \underline{-6} \quad \underline{+6} \quad \underline{-6} \\ -18 \leq 3x \leq 3 \\ \underline{3} \quad \underline{3} \quad \underline{3} \\ -6 \leq x \leq 1 \end{array}$$



$$7) \quad \frac{8}{-12} > \frac{4x}{-12} + \frac{12}{-12}$$

$$\frac{-4}{4} > \frac{4x}{4}$$

$$-1 > x \quad \text{or} \quad x < -1$$



$$8) \quad |2x + 5| - 3 > 2$$

$$|2x + 5| > 5$$

$$2x + 5 < -5 \quad \text{or} \quad 2x + 5 > 5$$

$$2x < -10 \quad \text{or} \quad 2x > 0$$

$$x < -5 \quad \text{or} \quad x > 0$$



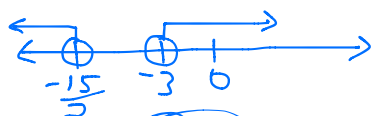
$$9) \quad \frac{2(-5x)}{-2} < \frac{17}{-2} \quad \text{or} \quad \frac{-5(-2x)}{+5} > \frac{10}{+5}$$

$$\frac{-5x}{-5} < \frac{15}{-5}$$

$$x > -3$$

$$\frac{-2x}{-2} > \frac{15}{-2}$$

$$x < -\frac{15}{2}$$



$$10) \quad |3x - 2| \leq 5$$

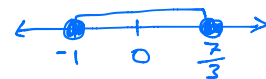
$$3x - 2 \geq -5 \quad \text{or} \quad 3x - 2 \leq 5$$

$$\frac{3x}{3} \geq \frac{-3}{3}$$

$$x \geq -1$$

$$\frac{3x}{3} \leq \frac{7}{3}$$

$$x \leq \frac{7}{3}$$



$$11) \quad 5(3 - 4x) = 7 + 2(4 - x)$$

$$\begin{aligned} 15 - 20x &= 7 - 8 + 2x \\ 15 - 20x &= -1 + 2x \\ +20x & \quad +20x \\ \hline 15 &= -1 + 22x \\ +1 & \quad +1 \\ \hline 16 &= 22x \end{aligned}$$

Reduce $\frac{16}{22} = \frac{22x}{22}$

$$\frac{8}{11} = x$$



$$12) \quad 3|4x - 1| - 11 = -2$$

$$\frac{3|4x - 1|}{3} = \frac{9}{3}$$

$$|4x - 1| = 3$$

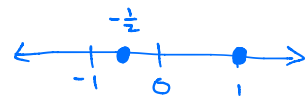
$$4x - 1 = -3 \quad \text{or} \quad 4x - 1 = 3$$

$$\frac{4x}{4} = \frac{-2}{4}$$

$$x = -\frac{1}{2}$$

$$\frac{4x}{4} = \frac{4}{4}$$

$$x = 1$$



$$13) \quad -3(1 + x) \leq 1 + 5x$$

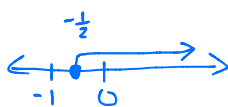
$$\frac{-3(-3x)}{+3x} \leq \frac{1 + 5x}{+3x}$$

$$\frac{-3}{-1} \leq \frac{1 + 8x}{-1}$$

$$\frac{-4}{8} \leq \frac{8x}{8}$$

$$-\frac{1}{2} \leq x$$

$$x \geq -\frac{1}{2}$$



14) a. Solve for h (don't graph) $SA = 2\pi r(r + h)$

$$\frac{SA}{2\pi r} = \frac{2\pi r(r + h)}{2\pi r}$$

$$\frac{SA}{2\pi r} = r + h$$

$$\frac{SA}{2\pi r} - r = h$$

b. find h if $SA = 40$ and $r = 2$ (leave π in your answer)

$$h = \frac{40}{2(\pi)(2)} - (2) = \frac{40}{4\pi} - 2 = \frac{10}{\pi} - 2$$

$$\text{or} \quad \frac{10}{\pi} - \frac{2}{1} \cdot \frac{\pi}{\pi} = \frac{10 - 2\pi}{\pi}$$

You may use a calculator ☺

15) The phone company charges \$12 per month for a land line. In addition they charge \$.05 per minute for all long distance calls. In the month of August your bill was \$18.50.

- a) Write an equation or inequality to relate the total cost to the number of long distance minutes (m) you used. $m = \text{minutes}$

$$12 + .05m = 18.50$$

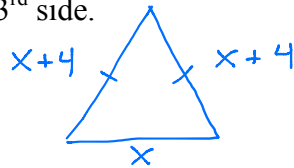
- b) Find the number of long distance minutes used.

$$\begin{array}{r} 12 + .05m = 18.50 \\ -12 \quad -12 \\ \hline .05m = 6.50 \\ \frac{.05m}{.05} = \frac{6.50}{.05} \end{array}$$

$$m = 130 \text{ long-distance minutes}$$

16) The perimeter of an isosceles triangle is 86 in. Two of the sides of the triangle are 4 in longer than the 3rd side. Find the length of the sides.

- a) Write an equation or inequality to relate the perimeter to the length of the 3 sides using (x) as a length of the 3rd side.



$$\begin{aligned} x + (x+4) + (x+4) &= 86 \\ 3x + 8 &= 86 \end{aligned}$$

- b) Find the length of all 3 sides.

$$\begin{array}{r} 3x + 8 = 86 \\ -8 \quad -8 \\ \hline 3x = 78 \\ \frac{3x}{3} = \frac{78}{3} \end{array}$$

$$x = 26$$

Side 1 = 26 in.
Side 2 = 30 in.
Side 3 = 30 in.

17) Kevin needs to run at least 120 miles this week. If Kevin ran 21 miles on Monday and he only has time to run 4 other days this week, what is the minimum number of miles he must run on each of the remaining days to attain his goal?

- a) Write an equation or inequality to relate the total miles (m) to the required distance that Kevin wants to run.

$m = \text{miles}$ $21 + 4m \geq 120$

- b) Find the minimum number of miles Kevin must run on his remaining 4 days.

$$\begin{array}{r} 21 + 4m \geq 120 \\ -21 \quad -21 \\ \hline 4m \geq 99 \\ \frac{4m}{4} \geq \frac{99}{4} \end{array}$$

$$m \geq 24.75$$

So, $m \geq 25 \text{ miles}$ in 4 days.